UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/758,484	01/15/2004	Kevin Curtis Griffin	ROC920030367US1	6194

30206   7590   05/19/2009
IBM CORPORATION
ROCHESTER IP LAW DEPT. 917
3605 HIGHWAY 52 NORTH
ROCHESTER, MN 55901-7829

EXAMINER
THOMAS, SHANE M

ART UNIT	PAPER NUMBER
2186	

MAIL DATE	DELIVERY MODE
05/19/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

	Application No.	Applicant(s)
Office Action Summary	10/758,484	GRIFFIN ET AL.
	Examiner	Art Unit	
	SHANE M. THOMAS	2186	

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>02 March 2009</u>.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1,3,4,6-16 and 36</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1,3,4,6-16 and 36</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☒ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some * c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage
         application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Remarks

In view of the appeal brief filed on 8/6/2007, PROSECUTION IS HEREBY

REOPENED.

To avoid abandonment of the application, appellant must exercise one of the following

two options:

(1) file a reply under 37 CFR 1.111 (if this Office action is non-final) or a reply under 37

CFR 1.113 (if this Office action is final); or,

(2) initiate a new appeal by filing a notice of appeal under 37 CFR 41.31 followed by an

appeal brief under 37 CFR 41.37. The previously paid notice of appeal fee and appeal brief fee

can be applied to the new appeal. If, however, the appeal fees set forth in 37 CFR 41.20 have

been increased since they were previously paid, then appellant must pay the difference between

the increased fees and the amount previously paid.

A Supervisory Patent Examiner (SPE) has approved of reopening prosecution by signing

below.

/Matt Kim/

Supervisory Patent Examiner, Art Unit 2186

Response to Arguments

Applicant's arguments contained in the Appeal Brief filed 3/2/2009, with respect to the rejections of claims 1,3,4,6-16, and 36 have been fully considered and are persuasive. Therefore, the rejection has been withdrawn and prosecution of this application reopened. Upon further consideration, a new ground(s) of rejection is made in view of "Efficient Management of Remote Disk Subsystem Data Duplexing" (IBM Technical Disclosure Bulletin - TDB-ACC-NO: NN960149).

All previously outstanding objections and rejections to the Applicant's disclosure and claims not contained in this Action have been respectfully withdrawn by the Examiner hereto.

Specification

The disclosure is objected to because of the following informalities: the first line of paragraph 52 of the pre-grant publication for this application appears to contain a typographical error: "Should alternatively <u>a be in group in</u> progress at block 104 …"

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 9 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per claim 9, it is not clear if Applicant intended the claim to read as claimed, where the creation of the first group includes reading a group number from an update request (in which case, it appears Applicant's specification is not commensurate with the claim limitation), or whether Applicant meant to claim that the "reading of the group number from an update request" occurs when completing the first group. Evidence of the later can be found with respect to figures 4 and 6 of Applicant's disclosure. In figure 4, Applicant clearly shows assignment of the group number to an update request at step 76 and does not show the reading of the group number. In figure 6, which represents the completion of a group of updates, Applicant clearly shows that the group number is to be read from an update request in step 116.

As such, claim 9 is rendered indefinite as it is not clear, based on Applicant's disclosure, how the claim limitation is to be interpreted. Nonetheless, for the purposes of examination, the Examiner has considered the claim limitation, in light of Applicant's disclosure, to read "wherein completing the first group further includes …"

<center><i>Claim Rejections - 35 USC § 102</i></center>

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on
sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1,3,6,8,10,11-15, and 36 are rejected under 35 U.S.C. 102(b) as being anticipated

by "Efficient Management of Remote Disk Subsystem Data Duplexing" (herein IBM).

As per claim 1, IBM teaches:

A method for updating data at a backup system (remote system - first paragraph of

page 1) **that tracks updates made to a primary system** (primary system - see first paragraph of

page 1)**, the method comprising:**

in response to receiving a first update request from an application (e.g. one of the

processes or operating systems running on each of primary site control units - middle of page 2)**,**

creating a first group including a first plurality of update requests, the first plurality of

update requests including the first update request; (page 2, algorithm step number 2, near the

bottom of the page as well as page 3, lines 5-7 - a group of updates may be collected into a single

consistency group).

in response to receiving a second update request from the application prior to

completing the first plurality of update requests (the Examiner is interpreting the

"completion" of the first plurality of updates to be the beginning of the collection of the updates

by the Serializer as taught in step number 2 of the lower portion of page 2; thus a second update

can occur after Toggle Time {middle of page 3}, but before the "completion" of the first group

of updates - new tracking begins right away - bottom of page 2**), creating a second group including a second plurality of update requests** (at Toggle Time, the roles of the buffers that store the updates for a current consistency group are reversed so that a second group of updates begins to be created - see algorithm of creating consistency groups of pages 3-4)**, the second plurality of update requests including the second update request** (the Examiner considered the second update as occurring right after Toggle Time but before the collection of the updates from the control units)**, the first update request of the first plurality of update requests in the first group having an order dependency relative to the second update request of the second plurality of update requests in the second group** (the first update occurred before the second update and as such has order dependency since they will be contained in separate consistency groups)**, with the update requests in each of the first and second groups capable of being processed concurrently and without regard for order relative to one another** (within each consistency group, the application of the updates is arbitrary - step 3 at the top of page 2 - and the updates are processed at the remote system concurrently - step 4, page 4)**;**

      concurrently completing the first plurality of update requests of the first group (the first plurality of updates are concurrently completed by the Serializer - step 4, pages 3-4)**; and**

      after concurrently completing the first plurality of update requests, concurrently completing the second plurality of update requests of the second group (the second plurality of updates is logically after the first, so the second plurality would be concurrently completed after the first - step 4, page 4)**.**

      As per claim 3, IBM teaches **wherein creating the first group further includes creating a group that includes a plurality of requests initiated at a plurality of applications**

(the first group contains the plurality of updates initiated by a plurality of applications - one running on each of the primary system control units - steps 1 and 2 at the end of page 2).

As per claim 6, IBM teaches **wherein creating the first group further includes updating a status indicative of whether the first group is active** (the status of the active buffer is changed when creating the first group - steps 3 and 4, page 3).

As per claim 8, IBM teaches **wherein concurrently completing the first plurality of update requests further includes issuing an update request of the first plurality of update requests** (the completion of the requests may encompass issuing the update to the remote system - step 2 of page 4).

As per claims 10 and 15, IBM teaches **wherein concurrently completing the first plurality of update requests further includes holding the second update request** (the second update request is held in the Current Buffer until a later Toggle Time - steps 3 and 4, page 3, and the bottom page 2 with respect to "new tracking").

As per claim 11, IBM teaches **wherein concurrently completing the second plurality of update requests further includes releasing a hold on the second update request** (when a second Toggle Time occurs, the hold on the second update will be release to begin the process of forming the next consistency group that contains the second update - step 2, bottom of page 2 and algorithm on the bottom of page 3).

As per claim 12, IBM teaches **wherein creating the first group, creating the second group, concurrently completing the first plurality of update requests and concurrently completing the second plurality of update requests further comprises creating the first group, creating the second group, completing the first plurality of update requests and**

completing the second plurality of update requests on the primary system (as taught above

with reference to claim 1, the consistency groups are created and concurrently completed -

algorithm at the bottom of page 3 - on the primary system by the Serializer).

      As per claim 13, IBM teaches **wherein creating the first group, creating the second**

group, completing the first plurality of update requests and completing the second plurality

of update requests further comprises creating the first group, creating the second group,

completing the first plurality of update requests and completing the second plurality of

update requests on the backup system (the creation of a consistency group on the backup

system occurs when a consistency group is received by the remote system - step 3, page 4; here,

the remote system is "creating" the group by storing the update requests from a consistency

group formed by the Serializer into a Control Unit Cache. Once the group has finished being

"created," such that all updates in a consistency group have been received by the remote system,

then the group may be completed by writing the updates to the remote system's disks - step 4,

page 4. Such a process is repeated for the second group of plurality of update requests).

      As per claim 14, IBM teaches:

      A method for updating data at a backup system (remote system - first paragraph of

page 1) **that tracks updates made to a primary system** (primary system - see first paragraph of

page 1)**, the method comprising:**

      synchronously processing a plurality of groups of update requests (consistency

groups are synchronously processed at every Toggle Time - algorithm at bottom of page 3)**, a**

first update request from an application in a first group of update requests from among the

plurality of groups having an order dependency relative to a second update request from

the application in a second group of update requests from among the plurality of groups
(all the updates from the applications running on a plurality of Control Units are collected in
Current Buffers over a period of time - step 1 in the middle of page 2, therefore it can be seen
that a first update within a Current Buffer has an order dependency with a second update from an
application that occurs at a later point in time <u>after</u> a Toggle Time, where the second update is
being considered to be part of a subsequent Consistency Group**), with the update requests in
each group being capable of being processed concurrently and without regard for order
relative to one another** (within each consistency group, the application of the updates is
arbitrary - step 3 at the top of page 2 - and the updates are processed at the remote system
concurrently - step 4, page 4**), and wherein receipt of the second update request prior to
processing of the first update request initiates the creation of the second group of update
requests** (the first update after Toggle Time would effectively create a new consistency group
since it would be the first update at the beginning of the new Current Buffer, which would later
become a consistency group after a second Toggle Time - see algorithm at the bottom of page 3**;
and**

        asynchronously processing the update requests in each group (the order of processing
updates is arbitrary - step 3, top of page 2**).**

        As per claim 36, IBM teaches **further comprising after completing the first plurality
of update requests, arranging the second plurality of update requests according to the
order dependency** (it can be seen that the second plurality of update requests would be
processed after the first group of updates are completed when a second Toggle Time occurs and

the second plurality are collected to form a second consistency group, which is order-dependent

with the first consistency group of updates - see algorithm at the bottom of page 3**).**

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over "Efficient

Management of Remote Disk Subsystem Data Duplexing" (herein IBM), as applied to claim 1

above, in further view of Clark et al. (U.S. Patent No. 6,487,645).

As per claim 4, IBM does not specifically teach but Clark teaches **wherein creating the**

first group further includes updating a count associated with a number of the first plurality

of update requests (update counter in step 322, figure 3). It would have been obvious to one

having ordinary skill in the art at the time the invention was made to have combined the

mirroring system of IBM with the teaching of including a count associated with the number of

update requests in order to have produced the predictable result of keeping track of the number

of updates residing in the Current Buffer. It would have been obvious to one of ordinary skill to

have used the counter value to read the exact number of records from the Current Buffer when

creating a consistency group.

Claims 7, 9, and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over

"Efficient Management of Remote Disk Subsystem Data Duplexing" (herein IBM), as applied to

claim 1 above, in further view of Micka et al. (U.S. Patent No. 5,592,618).

As per claims 7 and 16, IBM does not teach but Micka teaches **wherein creating the**

first group further includes assigning a group number to each update request of the first

plurality of update requests (time interval group number 503, which is assigned to each update

request coming from the storage controllers SSIDs1-3, similar to the Control Units of IBM, -

[9/50-62]).

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to have combined the mirroring system of IBM with the teaching of group

numbering of consistency groups of Micka in order to have produced the predictable result of

assigning a group number to each consistency group created by the primary system in order to

guarantee that the consistency groups were being applied in an order-dependent manner.

As per claim 9, IBM does not specifically teach but Micka does teach **wherein**

completing the first group further includes reading a group number from an update

request (when sent to the remote system, the group number would be read when the prefix

header 500, figure 2, is read in order to distinguish the current set of updates such as during the

application of the updates in step 1160, figure 8, and step 1403, figure 11).

It would have been obvious to one having ordinary skill in the art at the time the

invention was made to have combined the mirroring system of IBM with the teaching of reading

group numbers of consistency groups of Micka in order to have produced the predictable result

of maintaining order dependency with multiple consistency groups, thereby guaranteeing that the

consistency groups are being applied in an order-dependent manner.

Conclusion

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to SHANE M. THOMAS whose telephone number is (571) 272-

4188. The examiner can normally be reached M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Matt M. Kim can be reached at (571) 272-4182. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Shane M Thomas/   15 May 2009
Primary Examiner, Art Unit 2186

/Matt Kim/

Supervisory Patent Examiner, Art Unit 2186